Scarlet Fever: its Home Treatment and Prevention.

By Robert Milne, M.D.

In laying before you to-night my plea for the home treatment and prevention of scarlet fever, I shall, firstly, give details of the treatment; secondly, set out the advantages of this treatment; and, lastly, substantiate the treatment.

(*A*) Some Details of Treatment.

When first I adopted the method of treatment which I pursue, as lately laid before the medical public, I used carbolic oil 1 in 10. For twenty-five years, however, I have used pure eucalyptus oil. During the first four days in a scarlet-fever case, commencing at the earliest possible moment, I have pure eucalyptus oil gently rubbed in, morning and evening, all over the body, from the crown of the head to the soles of the feet. Afterwards this is repeated once a day until the tenth day of the disease. The tonsils I always swab with 1 in 10 carbolic oil every two hours for the first twenty-four hours, very rarely longer. (In swabbing I place a firm mop of cotton wool, the size of the last joint of the thumb, on the end of a pair of forceps. I thoroughly soak the wool in the carbolic oil, and then swab the tonsils and the pharynx as far up and down as possible.)

(*B*) The Advantages of the Treatment.

This being the simple and easy mode of treatment, let me say a word or two about its advantages:—

(1) When this treatment is commenced early—and I emphasize the fact that early treatment is vital—secondary infection never occurs and complications are unknown. (How serious a question is that of complications is borne out by a recent remark of a scarlet-fever superintendent. "After a short time," he said, "we have not only the scarlet-fever-germ infection to contend with, but other germs secondary to this, causing us the very greatest trouble.")

(2) *Absolute Prevention of Infection.*—With this treatment carefully carried out, I have no hesitation in allowing children to occupy the same

room or even sleep in the same bed; nor would I hesitate to take milk from an infected farm or dairy, provided the patient had been properly treated.

(3) *The Economy of the Treatment.*—One medical officer of health reported that thirty cases, due to milk infection, cost £300. Another stated that in his town of 70,000 inhabitants such a system would save many thousands of pounds every year. A specialist's view is that it would mean a saving of many millions annually to England alone. The treatment for a case means the cost only of a pint of eucalyptus and an ounce of carbolic oil.

(4) *Its Household Economy.*—The mother is free to attend to both the patient and her duties. The father is free to go to work without the slightest risk, and the children are equally free to attend school.

(5) No after-disinfection is necessary, for, the patient having been disinfected, nothing remains.

(*C*) Substantiation of the Method of Treatment.

When I left Scotland thirty years ago there was a hazy report throughout the country that if cases of scarlet fever were rubbed with ointment and oil the scales (in peeling) were thereby prevented from flying about, and thus the risk of spreading the infection lessened. Further, that if carbolic oil or other disinfectant were used, this risk was still further lessened. Acting upon this hint, I, along with others, began to use carbolic oil at the very commencement of the disease, and I found, as a result of experience of cases occurring in five different households with several children, that the infection was limited to one member of the family. At first, however, I did not fully realize the value of the method.

As I gave in the *British Medical Journal* of October 31, 1908, a résumé of some of my experiences in private practice, where I showed how safe it was for the children to live and sleep together, I will only here and now give one instance. In 1895, on the tenth day of the disease, I took one of the chaplains of the homes, who was peeling most freely after a severe attack, to my own home on a visit. There he mingled without any restriction for several days with my own children. All of these, I may mention, were very susceptible. None of them then had had an attack of scarlet fever, although four of them had it at different times later. In another private family of seven children, on three different occasions at intervals of many months, three of the children had

scarlet fever without any spread, although they all mingled unrestrictedly with each other.

The remaining portion of my paper deals with the cases of children in Dr. Barnardo's Homes. At present we have over 8,500 under our care. At the Girls' Village Home, Barkingside, Essex, there are at present about 1,300 in residence, the ages ranging from babyhood to 16 years. The village consists of a receiving house and sixty-seven cottages, and each of these cottages is occupied by from fifteen to twenty-five girls, with a lady in charge. The village covers sixty-four acres, and the cottages are widely apart. The various London homes have from 120 to 400 children.

My first connexion with Dr. Barnardo's Homes was due to an outbreak of scarlet fever at the Girls' Village Home early in 1880. I have said that to-day 1,300 girls are there in residence, but then the number was under 500. Among these 500 there were 120 cases. Never since then have we had an epidemic of this proportion; indeed, epidemics are with us of very rare occurrence, and when they do occur the cases are very few. A former President of the Local Government Board asked me some years ago: "Can you explain to us, Dr. Milne, how it is that you have so few epidemics among the children under your care in Dr. Barnardo's Homes? And how, when you do have such cases, they are so few in number? In our schools we have many epidemics, and these affect sometimes one-half, or even three-fourths, of the children in residence." This question drew my attention markedly to the undoubted fact which had prompted it, for it showed very clearly the marked effect of the lines of treatment I was in the habit of following in comparison with the usual treatment pursued by others in similar circumstances.

Since 1880—that is, for twenty-nine years—I have had no such experience with scarlet-fever cases as those I shall now refer to. All have occurred since the appearance of my paper. The record is unique. The cases have been seen and carefully examined, and their histories carefully gone into by some seventeen medical superintendents of scarlet-fever hospitals and by over 200 medical officers of health and general practitioners.

Limitation of Spread of Infection.—Let me remark that the astonishment expressed by these visitors is universal among medical men whenever they have observed cases under the treatment. On many occasions I have kept a child in the same room with from six to twenty-five other children—all under 14 years of age—

without any infection spreading. One case with specially bad tonsils was seen by a medical officer of health, who said, "If tonsils ever convey infection, this would!" Another, after seeing many cases, said, "It is marvellous. To think that I was so long in charge of a scarlet-fever hospital, and in spite of all I could do, and keeping the children seven and eight weeks, to find a fresh outbreak on their return home; yet here, before our eyes, we see case after case in cottages with from sixteen to twenty-five others, mingling freely with one another all the time, and after a few days with thirteen hundred other children, both in school and at church. Our system of treatment seems so ridiculous, with its expense, its labour and worry, in contrast to this simple plan, the efficacy of which is beyond question." Both doctors and public have such a firm conviction of the infectious nature of scarlet fever that I find it strikes everyone with astonishment to discover that, treated thus, it is as little infectious as chilblains. During the year ending October 31, 1909, twenty-four cases occurred in the Village Home. These occurred in eighteen different cottages and in the receiving house. There were three cases in the latter and in one of the cottages; while in both of these, as well as in another cottage, two cases occurred on the same day. Every case had all the ordinary symptoms of scarlet fever, followed by well-marked peeling. None of these cases were isolated. Most of them were treated in their own cottages. The other children visited them daily, while in most instances girls slept in the same room. After ten days the patients were allowed to be out of bed and to mingle freely with any of the thirteen hundred other children in the village at play, at school, and in church. These patients were inspected by many medical officers of health, superintendents of scarlet-fever hospitals, and general practitioners. In the case of one child, aged 4, the symptoms of scarlet fever appeared on the day following her admission to the home. Her temperature rose to 103·8° F., and the case was very severe. On the eleventh day, when the child was peeling most freely, she was seen by a scarlet-fever hospital superintendent and a local secretary of the British Medical Association. Some sixty-nine other children were in the home, sixteen of whom were under 4 years of age, and with these she was at play. The superintendent's remark was "Good gracious, is it safe? I see the scarlet-fever case and I see the healthy children all about in the room, but I must have a few days to think over it, for I cannot take it in. It is so contrary to all my teaching and experience." At the end of the fourth

week she was seen by a medical officer of health with some fifty children at dinner under the trees in the open air. She was inspected two days later by other medical practitioners from a large society.

The final cases occurred in the beginning of October of this year. On October 27 they were inspected, on return from school, by one of London's most celebrated physicians. He remarked, after going round, "How hard it will be for medical men to give up their old practice, although the facts are so clearly set before them! Such an interesting sight I have not seen."

Leopold House Epidemic, 1909.—In Leopold House, one of our London homes, we have 300 boys from 6 to 14 years of age. On February 4, 1909, a case occurred there. The boy was transferred at once by my son to Her Majesty's Hospital in Stepney Causeway, and there the usual treatment was continued. Further cases ensued, until on April 8 thirty-five cases had been recorded. These were treated in two wards, amongst other patients. After ten days nine of these were passed on for isolation to a cottage near, because new cases were still occurring at Leopold House, and because we wanted room in the wards. During the period that these were in our hospital we had over 180 patients in residence. These included fourteen under 5 years of age. The operations performed during that period included the following:—

Removal of large portion of scapula	1
Hernia	3
Cataract needled	1
Osteotomy of femur	2
Tonsils and adenoids removed	1
Nerve-grafting of facial nerve	2
Mastoidectomy	1
Circumcision	3
Excision of knee	4
Movement of elbow-joint	2
Paraffin injection for bridgeless nose	1
Suture of median nerve and separation of tendons	1
Osteomyelitis of upper end of tibia	1
Astragalectomy	1
Fracture of humerus	1
Empyema	1
Subtrochanteric osteotomy of thigh-bone	1
Bruised torn hand and fingers	1

This epidemic was certainly caused by pen-and-pencil infection, for my son remarked on two occasions that two parallel infections were running. The lads attended six different schools outside, yet all the cases came from two schools. Not one of the lads had a pen or pencil of his own, but got both at school. Within three days after the lads

were kept from these schools there were no more cases. A similar experience occurred in another home. This points to an important but neglected item in school hygiene. I have not found it referred to in any text-book, yet daily in London alone—both in ordinary and higher schools—some millions of pens and pencils are handed out to children. Naturally and always children put these in their mouths, as the most casual inspection will show. Need we wonder that scarlet fever, measles, whooping-cough, mumps, and even diphtheria and syphilis are spread?

Special Incidents.—Special incidents in connexion with this outbreak are worthy of comment. On February 23 a boy was admitted to the hospital to be operated on for hernia. The lad in the next bed on the 26th had been down with scarlet fever for nearly forty-eight hours. When I went round the ward on March 1, I found that the lad had scarlet fever. "How is this?" I inquired. "Has our plan of treatment failed?" It was found that early in the morning of the 26th the hernia patient borrowed the washing flannel and towel from the scarlet-fever case in the next bed, and that morning, before the lad was rubbed with eucalyptus oil, he had used both. The mode of infection thus became apparent. Further, that morning the lad had been out of bed and taken the breakfast to six boys in an adjoining eye ward, where there had been no scarlet-fever cases. He handed them their bread and butter, &c. This occurred on March 1. On March 3 and March 4 three of the lads in this side ward developed scarlet fever. This is the only occasion on which I have known scarlet fever spread after a patient was under treatment, and we need not be surprised at the fact when the circumstances are considered. All the cases had from slight to very heavy peeling. One lad went out without permission, caught cold, and died a week later of double pneumonia. The right lung, we found, was solid; the left lung was nearly so. All the time the urine was normal in quantity, and it contained very slight albumin. The kidneys were in a healthy condition and normal in weight. It is a most noteworthy circumstance that the cause of death was pneumonia—a disease of rare occurrence after scarlet fever—while the kidneys were healthy.

An Otorrhœa Case.—A lad was admitted to the hospital suffering from scarlet fever and chronic otorrhœa. After a few days mastoiditis gradually came on. I operated on Monday, March 22. The mastoid antrum was opened and pus found. The iter was also opened up, but the ossicles were not disturbed. On March 24 he was satisfactory in every way.

An Ichthyosis Case.—The twentieth case at Leopold House was an extreme case of ichthyosis. When the eucalyptus oil was applied it caused such pain that my son wrote particulars of the patient, and sent him to the isolation hospital. This is the only case in which I have found that the treatment was inapplicable.

Medical Inspection.—In connexion with this outbreak I addressed a letter to the secretaries of the Medical Officers of Health Association and of the Medical Officers of Public Schools Association; also to the medical superintendents of scarlet-fever hospitals in London. I explained all the circumstances, gave the list of operations, and conveyed an invitation to them to visit the hospital at 19, Stepney Causeway. In response I had many visitors from the hospitals, who spent hours in investigating the cases. They were amazed to find scarlet-fever patients in beds side by side with these serious operation cases. In some instances the rash was fully out and peeling was progressing in various stages. The history of each case was fully gone into: for instance, the flannel-and-towel case, which was said by several to be most interesting and instructive; also the pneumonia case, which showed how free the kidneys were from attack. Many of my visitors said they were the most convincing evidence of my claims for the benefit of the treatment. The hospital space is 750 cub. ft. per patient. Moreover, we have not through ventilation, while the lads can join hands from bed to bed—a great contrast to 2,000 cub. ft. and through ventilation.

Stepney Home Epidemic.—In the Stepney Home there are some 350 lads, mostly over 15 years of age. Since March 25 to July 5 eleven cases have occurred, while in some of the other homes there have been twelve cases. These were all treated on the same lines, and were mixed with the same class of patients in Her Majesty's Hospital as the above cases from Leopold House. In the Stepney cases the symptoms were well marked, both in the initiatory stages as well as in the peeling. One case in this outbreak calls for special note. The boy came under medical care after he had been ill for some days. His history sheet indicated sore throat for several days with headache, vomiting, and well-marked eruption. Then he was treated in the usual way. On the fifteenth day he had a rigor, pyrexia, and pain at the angle of his jaw. An abscess formed. This was followed by heavy albumin and pericarditis. He died on the thirty-sixth day. To me this does not negative the claim I have made for the value of the treatment. For in this case the treatment was not commenced by any means at the earliest possible moment, and I

always strongly advise the utmost promptitude. It comes into line with many of the hospital cases, for ample time was allowed for secondary infection. May not the question be fairly raised in this connexion: Do not *all* serious complications come through secondary infections? I am inclined to think they do. A medical officer of health saw some of these cases in the various stages and remarked: "Good heavens, Milne, a scarlet-fever case between two cases of recent operations for hernia! I could not have believed it unless I had seen it."

An Experience among Babies.—I cannot resist including the following important testimony: On February 26, 1909, Dr. Charlotte Wheeler, resident medical officer in our "Babies' Castle" Home, Hawkhurst, Kent, reported that they had an outbreak of scarlet fever, and that she was treating the patients on the lines I have indicated. Six cases occurred from February 24 to March 3, and these were nursed together in the babies' room, being sent there as soon as they were found, the nurse attending to the other children at the same time. On March 10 the children all returned to their respective nurseries, and the service-girl began very light work in the nursery. She was peeling freely at the time she started work among the uninfected children. One case peeled heavily, the others more slightly. There has been no nephritis or other trouble except with one child who had been previously suffering from otorrhœa, which had ceased, but recommenced. Although there were some eighty-four children in the home, the oldest being 8 and 9 years of age, no further case occurred. Moreover, they are delicate children, placed there for special nursing.

At Sea.—A very important experience is that of a medical friend who had seen some of the work I have described above. Having charge of an emigrant party to a distant colony, with many children, he found some cases of scarlet fever appear among them soon after starting. He had a good supply of all the necessaries for the method of treatment I have advocated. No case appeared after the third day out. Consequently there was no spread of the epidemic.

Outbreak at our Birkdale Home.—This home is under the care of Dr. F. A. E. Barnardo—a brother of the founder of these homes. The children are all in most delicate or crippled condition, and there were forty-nine in residence. Four of the inmates were attacked in July. In Dr. Barnardo's absence his assistant sent the first two cases to the isolation hospital, but they were brought back on Dr. Barnardo's return and treated. They were placed, with the other two cases from the commencement of the attack, in a room where four other children

slept every night. They were from 8 to under 2 years of age. None of these four had had scarlet fever, yet there was no infection nor complication. I have before me frequent and full reports of urine tested; on every occasion there was no albumin.

It will show the condition of the children in this home when I specify the condition of those children affected. The first suffered from congenital deformity of both hands and feet; the second was very delicate, and had undergone amputation of both legs below the knee; the third weighed 6¼ lb. when admitted at 8 months old, and suffered from congenital syphilis; it had also a bridgeless nose, and suffered from ozæna and otorrhœa; the fourth case suffered from Pott's disease of the spine and had a sinus. Those who slept in the same room included two cases of infantile paralysis and two of malnutrition. Their ages were 6, 4, 2, and under 2 years of age. The room in which they were treated was on the same landing as the bedrooms in which all the younger children of the home slept. The nurses went freely in and out among the children all over the home. The youngest and feeblest children, a note says, were chosen for this test. Dr. Barnardo was delighted with the result, and will always adopt the same treatment.

In conclusion, I have given you some details of treatment, the advantages claimed for it, and sufficient proofs, I trust, to substantiate the same.

DISCUSSION.

Dr. GOODHART said he had listened to both papers, which were full of facts, with extreme interest. Of Dr. Armstrong's he could not say much, except that some of his observations bore resemblance to points he had himself noted. He had always said when he went to a public school to see an outbreak of measles that he would rather see anything else, because there were a large number of cases, and he had observed that the danger of cases increased as the epidemic went on. It seemed impossible in the English climate to get the amount of thorough ventilation which was necessary to dilute the poison which was generated. The other facts in Dr. Armstrong's paper seemed of a kind to be thought over and studied rather than debated. But he had seen and talked over with his friend, Dr. Milne, some of his observations with regard to scarlatina, and it seemed to him that Dr. Milne's work at Dr. Barnardo's Homes, provided it were substantiated, was of the most epoch-making that had been done for many years. Personally, he accepted the facts—he did not see how anyone could get away from them—and that being so, it was unquestionably a revolution in the treatment of scarlatina. As he rightly said, if his statements were true, and one could avoid turning the home into an isolation hospital, and putting everything upside down and scattering the

family far and wide, and costing much, it was a comparatively easy way. Dr. Milne rightly said the treatment was not new. Twenty years ago he (Dr. Goodhart) put into his little book on children's diseases a very fair and full description of Dr. Jamieson's treatment on the same lines at Edinburgh.[1] It was not perhaps quite so simple, but Dr. Jamieson, in 1884, made the statement that by inunction of children from the crown of the head to the soles of the feet, and swabbing their throats, he had never seen the spread of any case of scarlet-fever infection during the three years in which he had carried it out. From time to time he (Dr. Goodhart) had seen many cases of scarlet fever, and he had often said, Why not try inunction? The reply had always been that the doctor did not dare. Even after Dr. Milne's paper he believed the practitioner would not dare unless the subject were taken up by medical officers of health. If medical officers agreed with the facts, and that the plan was a successful one, medical officers all over the country should take it up and insist upon it being carried out; then the general practitioner could say he was acting on authority. Dr. Milne said he used carbolic oil for swabbing the throat, 1 in 10 in strength, and that this was done every two hours for twenty-four hours. He (Dr. Goodhart) did not like the idea of that strength being used in a child's throat so often; it could scarcely be free from risk. Dr. Jamieson years ago suggested the use of glycerine and boric acid, and he inclined to think it might be equally good for purposes of disinfection, and have this additional advantage—that in all these throat conditions glycerine often had a marvellously good effect. He regarded the paper as an admirable one, which marked a distinct advance in medicine.

Dr. THEODORE THOMSON, C.M.G., said he was specially interested in the paper of Dr. Armstrong, because in his early days at the Local Government Board he was instructed to inquire into the control of measles in England and Wales. He gathered that Dr. Armstrong was not very hopeful of being able to control measles. But with regard to the observations as to the weight of boys during the incubation period, he believed that, if these observations afforded trustworthy indications, it could be seen by weighing the boys day by day whether they were going to develop the disease, and that the outbreak could be checked by timely isolation of those presenting the variations in weight remarked by Dr. Armstrong. He would have liked Dr. Armstrong to supply a few more facts: how many boys he had under his observation, how many were weighed daily, what proportion of them lost weight during the incubation period, how many of them were attacked, and what happened to the remainder?

Dr. PARSONS said that one point in Dr. Armstrong's paper which seemed open to a difference of opinion was his remark as to the uselessness of trying to prevent an epidemic of measles, because if they were to have the disease they might as well get it over quickly. It was owing to the prevalence of that feeling that measles still remained with us and caused such a high mortality. By far the larger mortality from measles occurred under five years of age, and

[1] Goodhart, J. F., "Diseases of Children," 4th ed., Lond., 1891, p. 181.

mostly in the second or third year of life. If the period at which the child had the disease could be postponed to a period when it was found to be less fatal, the general death-rate from it must diminish. If medical men could succeed in checking epidemics in public elementary schools, more children would be saved and the fatality from the disease would be diminished. It had been stated that epidemics in schools in London were not found to occur unless the proportion of unprotected children reached 30 or 40 per cent. When that proportion was reached if measles was introduced, an epidemic occurred, until the number of unprotected children in the school was reduced to between 15 and 20 per cent., and then it declined.

Medical officers of residential institutions had the advantage that they could watch cases of measles and scarlet fever from the first, and get hold of them in the earliest stages, as compared with the medical officer of health who could only look after them after receiving notification. Dr. Williamson had shown that of the secondary cases of scarlet fever occurring in households, by far the greater number were contracted before the removal of the first case. In that way the failure of hospital isolation to check the spread of scarlet fever was explained. With regard to Dr. Milne's paper, the eucalyptus-oil treatment of scarlet fever was by no means new. A paper was read before the Epidemiological Society in 1889 by Mr. Brendon Curgenven, and he claimed that by it isolation and disinfection would be unnecessary in the case of scarlet fever. There was another paper, by Dr. Joseph Priestley, in 1895, who, while not endorsing all that Mr. Curgenven had claimed for it, still considered it useful; yet it had not come into general use. If isolation had not been rendered useless, was it because the treatment had not been carried out in the right way, or because the cases were not secured sufficiently early to prevent infection occurring? He did not know how far the throat treatment explained the better results claimed by Dr. Milne. At present more attention was paid to throat infection than to skin infection. Infection by means of pencils was well known to school medical officers; and mention of it was to be found in the official memorandum of the Local Government Board on schools in relation to infectious diseases.

Dr. F. M. TURNER said that many persons had accepted Dr. Milne's invitation to inspect his cases. If any of them had had the courage to follow Dr. Milne's lead, he hoped they would give the Section the benefit of their experience. He, personally, had been so impressed by Dr. Milne's results that he thought the treatment should be tried in a scarlet-fever hospital, and he began his experiment in March this year. Dr. Milne's contention was that his treatment could be used instead of isolation. This contention, of course, could not be tested by experience in an isolation hospital on ordinary cases; but there were three aspects of fever-hospital work to which Dr. Milne's theories, if correct, ought to apply. Firstly, the fever hospitals receive a large number of doubtful cases, and mostly treat them in single-bed isolation rooms. If eucalyptus was a preventative of infection, such cases could with impunity be treated in the general fever wards. Secondly, all fever hospitals find that a

certain proportion of their discharged cases, usually from 3 to 4 per cent., are followed by fresh outbreaks of scarlet fever in the home. If Dr. Milne's theory were correct, they would be able to prevent entirely these return cases. Thirdly, small outbreaks of scarlet fever frequently occurred among the children in the diphtheria wards. To these Dr. Milne's treatment, instead of isolation, was strictly applicable. Since March he had had under his own care 152 cases admitted, which he rubbed with eucalyptus oil. Of those, seventeen were still under treatment, and 135 had been discharged or had died. Two died and 118 were sent home, and fifteen were sent to a convalescent hospital. At his request, one of his assistants started the treatment in an adjoining ward; and he had now had fifty completed cases. So that the total number of completed cases was over 180. As regards the mixing of doubtful and certain cases, in his own ward he had treated eighty-nine certain cases of scarlet fever, seventeen doubtful cases, and twenty-nine who were at first doubtful but finally considered not to have scarlet fever at all. Only one of these caught scarlet fever. Dr. Lakin, however, had not been so fortunate. Among his fifty cases only seven proved not to have the fever, and of these seven, two subsequently developed it. As regards return cases, he had discharged four, at the homes of whom an outbreak subsequently occurred. One was a girl of 14, who had a definite rash and peeled slightly, and by the eighteenth day the peeling was practically complete. Another was a girl of 10, a moderately severe case, but with very free peeling, and twenty days after the onset she was well. He wrote to the medical practitioner who sent her in, saying he had treated her by the new method, and suggesting that she should be sent home. He replied that he would much rather he (Dr. Turner) kept the case a little longer. She was therefore kept ten days longer. She was discharged on the thirty-fourth day, and not very long afterwards another case occurred in her home. Another patient, a boy of one year, was oiled in the correct manner, and was discharged on the sixteenth day; there had been no peeling, and Dr. Turner saw no rash. The mother took him home, and later the doctor who certified the case telephoned that he saw typical peeling. He saw the child the same afternoon, and on two occasions tried to see the peeling, but failed. Six days later his sister developed the fever. The fourth case was that of a boy aged 4, who was discharged on the fifteenth day of the disease, and he had had much trouble and correspondence about that. They gave, on his own discharges, an infectivity rate of 3·4 per cent. Including Dr. Lakin's fifty cases, the rate came down to 2·9 per cent.—not very different from what they were used to. They might have been expected to be a little under the average, because the worst return cases occurred in the winter, and his testing of the cases ran from March to the present time. After the treatment had been in use two or three months he had, within a week, three notifications of return cases. His discharges had been forty to fifty, showing a 10 per cent. rate; that was so much more than they were used to that he feared he might lay himself open to a charge of malpraxis if he went further. The cases treated by Dr. Milne's method were discharged earlier than usual —from fourteen days up to thirty-five days or more—not after ten days, as

Dr. Milne considered safe. As regards the prevention of return cases, the experiment was a partial, if not a total, failure.

As regards scarlet fever in the diphtheria wards, he had used the treatment several times on doubtful cases; but the first certain case that he had treated thus and left in the ward with other children—twelve of whom were under 5 years of age and five over—was a little girl, admitted on July 14. Two cases of scarlet fever had broken out in that ward on August 25. These two were removed to a small isolation room, and they, with all the other children remaining in the ward, were oiled for ten days. On September 2, six days after oiling commenced, Ivy Morgan developed a severe attack of scarlet fever. She was not removed, but treated throughout with the other children. She developed nephritis, which caused her to be detained for a long period, and she was discharged on November 18. No cases of scarlet fever occurred until November 8, two months after Morgan developed her disease. This patient was oiled instead of being isolated, but the oiling was a distinct failure, as a further case developed on the ninth day, two cases on the tenth day, and another—the fourth—on the eleventh day. In all three respects, therefore, in which his experience had been used to test Dr. Milne's treatment, it had been at least a partial failure. As regards complications, he did not find any great difference between the cases treated and untreated. In his own ward he got a higher than average rate for albuminuria, abscess of the neck, and tonsillitis; a lower for otitis, adenitis, and nephritis. Dr. Lakin found an increased rate in three complications out of four. He did not attach much importance to those complication-rates, because the children attacked were under the average age. He was more concerned with the discrepancy between Dr. Milne's facts and his own as regards infection. He mentioned several possible causes of the difference, but did not regard any of these as a satisfactory explanation. He hoped that further work might be done until the question was cleared up. He congratulated Dr. Milne upon his courage in bringing the matter forward.

Dr. BIERNACKI stated that the method was being tested at Plaistow Hospital. Inunction was employed in the case of every patient admitted to the hospital, whether the case was certified as suffering from scarlet fever or from some other disease. This was to safeguard patients in the wards reserved for diseases other than scarlet fever from contracting that disease in event of an unrecognized case of scarlet fever gaining admission to these wards. Nevertheless, patients were infected by scarlet fever in them. Again, in the scarlet-fever wards 700 cases were dealt with by inunction. There were many doubtful cases in these particular wards, and five of them acquired scarlet fever from the undoubted cases. Further, on sending undoubted and doubtful cases to the convalescent home, five of the latter developed scarlet fever there. Five members of the nursing staff who were carrying out the treatment developed scarlet fever. While the treatment was going on there was an increased prevalence of septic complications—particularly otitis—among the scarlet-fever patients. The number of return cases also rose above the average.

Dr. BUCHAN said the paper of Dr. Milne was not so important to medical officers of health as regarded treatment as from the point of view of the facts which he (Dr. Milne) set before the Section. Those facts showed that scarlet fever was a disease which was much more infectious during the first ten days than it was during the later periods. Recently he had a case of scarlet fever which was kept at home for a fortnight, and attended school for the three succeeding weeks, with no effect in that school. He did not suggest that one should therefore allow all cases of scarlet fever to go after a fortnight's isolation broadcast amongst the population, but he mentioned it to show how relatively slightly infectious scarlet-fever cases were in the peeling stage, provided there were no discharges from the mucous membranes. With regard to the point made by the author that the mother should be free to attend her household duties and the father to go to work, he did not see that the treatment made any difference to that. Statement No. 5 had nothing to do with the treatment which Dr. Milne pursued, but it was important from the point of view of public health. He would like Dr. Milne to say what the rationale of his treatment was. With eucalyptus and carbolic oil in use there might be an idea that disinfection was intended. But neither carbolic oil nor eucalyptus oil was a true disinfectant. He did not see what evidence there was that a patient was infected by means of a washing-flannel when he understood he lay in the next bed to a patient who had scarlet fever.

Dr. MEREDITH RICHARDS remarked that Oliver Wendell Holmes had said that homœopathy had one advantage—namely, that it gave one the opportunity of becoming acquainted with untreated disease. He believed this largely applied to Dr. Milne's methods. He (Dr. Richards) did not think anyone could explain how inunction could have any benefit in scarlet fever. It was a case in which one ought to assume that the cogency of the argument and the amount of facts produced should be in proportion to the departure from the probabilities; and he thought Dr. Milne had not brought forward sufficient data. If one was to believe that the inunction of eucalyptus was effective in bringing to an end an infection by scarlet fever, the disease must be assumed to lie in the skin. Yet he thought it was generally agreed that the skin was not infectious. That was proved by the fact that desquamating children frequently attended schools and lived with unprotected children without infection taking place. And it was known that infection in scarlet fever was present before desquamation began. Desquamation, he believed, was due to a chemical toxin. He had failed to become convinced that swabbing of the throat could be efficacious to the extent that they were asked to believe. Diphtheria throats could be swabbed by the week or fortnight, and experience seemed to show that swabbing had little or no effect on the bacilli. The bacilli were often in crypts $\frac{1}{2}$ in. below the surface of the tonsils, where swabbing could not penetrate. He knew of no reason why they should be more successful with scarlatinal throats.

Dr. CROOKSHANK said he agreed with what Dr. Meredith Richards had said: that members had had an opportunity of seeing what untreated disease was like. He thought Dr. Milne had certainly proved that when once the horse

had been stolen it mattered very little whether one locked the stable door or not. Once the outbreak had started, Dr. Milne had not perhaps got worse results by treating scarlet fever with eucalyptus oil than other people had obtained with other methods. The title of the paper was "Scarlet Fever: Its Home Treatment and Prevention," and he understood that Dr. Milne's conclusion, from his observations, was that scarlet fever could be safely treated at home, and even that father could go to work and mother could attend to her household duties. But he did not think Dr. Milne had brought forward a single point to show that such home treatment could be safely conducted. The results given were from treatment at hospitals with skilled nursing. He asked what steps had been taken in the wards to prevent infection by sprays, spoons, glasses, &c. That 30 out of a community of 300 fell within a month or two was very much the usual experience. When scarlet-fever cases occurred in diphtheria wards, granting there were proper nursing, skill, and observation, infection did not take place nearly so frequently as the general public thought. Dr. Milne's results should be compared with experience in isolation hospitals. The superintendents of such institutions do not admit that scarlet fever spreads with extraordinary rapidity when the patients are kept in bed, with the observance of certain simple rules.

Dr. J. C. THRESH wrote with regard to Dr. Milne's paper that the treatment of scarlet-fever patients by inunction with eucalyptus oil had interested him for several years, and when he had charge of the small isolation hospital belonging to the Chelmsford Rural District, he used it in nearly all cases, and, so far as he was aware, there were no return cases. During one epidemic the hospital was overcrowded, and about a dozen patients were accommodated in a tent. All the patients did extremely well. He formed a very pronounced opinion upon its value, but whether it rendered a child non-infectious after ten or twelve days he was not able to determine. The popular opinion that a child is infectious so long as it shows the slightest sign of "peeling" is so strong that he did not dare to send out a child until desquamation had practically ceased. Many medical officers in hospitals would, he believed, try the experiment if they could feel certain that they were not laying themselves open to an action for damages if a return case occurred. The enormous pecuniary and other advantages which would accrue to the community if Dr. Milne's claims were substantiated, as he believed they could be, led him to hope that some means might be devised whereby the treatment could be tested under conditions which would render the results conclusive.

Mr. ARMSTRONG, in reply, said that in an examination of a series of suspects by the weight test, a marked difference had been observed between those who were developing measles and those who, for the time, escaped. Referring to the remarks of Dr. Parsons and the President, as to the great mortality from measles in infants up to two years of age, his contention was that it was due to pneumonia and similar complications, produced by the concentration of the poison from the aggregation of a number of cases with inadequate accommodation.

Dr. MILNE, in reply, said that one or two comments had been made as to the alleged risk of using 1 in 10 carbolic oil both in regard to the throat and to the kidneys. He had used it for thirty years and had never found that it gave pain or caused trouble in any way. In fact, it greatly relieved pain and enabled the patient to swallow with comfort. Drs. Turner and Biernacki had given reports of their experience in isolation hospitals. One important point to be borne in mind in this connexion, however, was that in hospital practice the medical attendant is unable to apply the treatment at the earliest period of the disease, and he regarded that as of vital moment. Consequently, such cases as had been reported upon came under the category of secondary infection, regarding which he had asked in his paper: "Are not *all* these complications caused by secondary infection?" The dangers of pen-and-pencil infection, it was said, had already been recognized. But what had been done in the matter? We could not insist too strongly or urgently upon the necessity for absolutely doing away with this real and horrible danger. By it millions of children are daily exposed to numerous deadly diseases. Since his experience of two epidemics undoubtedly arising from this source, every child in the schools under his medical care had its name on both pen and pencil. There was no transfer of one to another, and consequently all risk of infection from this source had been eliminated. He had never urged that his proposed plan of treatment should be taken up indiscriminately. He had merely set forth his experience and had repeatedly asked that it should be tested under the united care of the medical attendant and the medical officer of health. Dr. Curgenven's method had been mentioned as if he used pure eucalyptus oil. What he used was Olenshaban oil, but he found it fail (as Dr. Priestley did) and had to return to what he had used for years to re-test thoroughly his former conclusions. The question was asked, "How was it that in his former paper the ages of the girls at the Girls' Village Home were given differently from those he had given to-day?" As he had mentioned in this paper, many babies were constantly passing through the receiving houses, where the case upon which he commented occurred. The child, therefore, was constantly in contact with sixteen other children of under four years of age.